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The Effect of Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR) and Non-Performing Loan (NPL) Against Return on Asset (ROA) With Net Interest Margin (NIM) as an Intervening Variable in BUMN Bank Listed on the Indonesia Stock Exchange 2018-2022

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ABSTRACT: This study aims to determine the effect of Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR) and Non-Performing Loan (NPL) in the Return on Asset (ROA) with Net Interest Margin (NIM) as an Intervening Variable in BUMN Bank Listed on the Indonesia Stock Exchange 2018-2022. The independent variable used in this study is Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR) and Non-Performing Loan (NPL). The dependent variable used is Return On Asset (ROA). The intervening variable used is Net Interest Margin (NIM). The method used in this study uses nonprobability sampling technique, using secondary and quantitative data. The analysis technique in this research uses Smart PLS 3.0 by analysing the inner model such as the coefficient of determination, hypothesis testing and path analysing. The research show that, CAR has a significant and positive effect on NIM, LDR and NPL have no significant and unidirectional effect on NIM, CAR and LDR have no significant and unidirectional effect on ROA, NPL and NIM have a significant and unidirectional effect on ROA, NIM can mediate the influence of the variable CAR on ROA, NIM cannot mediate the influence of the LDR and NPL variables on ROA.

KEYWORDS: Capital Adequacy Ratio (CAR), Loan to Deposit (LDR), Non-Performing Loan (NPL), Return on Asset (ROA), Net Interest Margin (NIM)

1. INTRODUCTION

The banking world in Indonesia has an important role in building an economic and financing system that is used as a financial intermediary. Furthermore, banks are a means of implementing government policies, good bank conditions are important for the economy in Indonesia. As life in society and economic transactions in a country develops, it requires an increase in the roleof banking factors through the development of service products in the form of savings deposits, current account, deposits, as well as providing credit or loans to the public.

According to Bank Indonesia (2006), a bank is a company that carries out an intermediary function for funds received from customers. If a bank fails, the impact will affect customers and institusions that store funds or invest their capital in the bank. Because of the important role of banks in carrying out their functions, they need to be regulated properly and correctly. This aims to maintain customer trust in banking activities. (Setiyono et al., 2023) argue that banks use more funds from the public than their own capital. The bank pays great attention to the performance and management of resources carried out by management to achieve the goals that have been set. The development of the banking industry is expected to go through ups and downs of economic growth. According to Indonesian Law no. 10 of 1998, banks are business entities that collect funds from the public in the form of savings and distribute them to the public in the form of loans in order to improve people's living standards.

Return on Asset (ROA) is a ratio showing the ability of all existing assets to be used to generate profits (Hayyuni, 2020). A high ROA shows that a bank is able to maximize the use of its assets to generate high profits and achieve a better position in efficiency and effectiveness. To maintain or increase ROA, it is necessary to pay attention to several factors that influence ROA including Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Non Performing Loans (NPL) and Net Interest Margin (NIM). Net Interest Margin (NIM) is a ratio that is a benchmark in presenting a picture of a bank's ability to generate net interest by managing its productive assets. NIM is used as a mediating variable because it can influence the net income of banks. The increase in ROA is due to an increase in the NIM value, because every increase in net interest income, which is the difference between the net interest costs and total interest income, results in an increase in profit before tax which ultimately results in an increase in ROA (Purnamasari & Renanda, 2022) NIM shows the ratio of bank interest income (loan interest income minus deposit interest costs) to outstanding credit. This ratio shows the bank's ability to obtain operational income. The higher the NIM ratio, the more effective the bank is in placing company assets in the form of credit.

Based on the above research and the phenomena that occur as well as differences in the results of previous studies, profitability is an important issue in banking. Thus the authors conducted further research in this study with the theme "The Effect Of Capital Adequacy Ratio (CAR), Loan To Deposit Ratio (LDR) and Non-Performing Loan (NPL) Against Return On Asset (ROA) with Net Interest Margin (NIM) as an Intervening Variable in BUMN Bank Listed on the Indonesia Stock Exchange 2018-2022".

2. LITERATUR REVIEW

2.1 The effect of CAR, LDR and NPL on NIM

The higher the level of capital adequacy (CAR) will be a measure of the success of bank management in obtaining high profits. The positive influence on NIM is that the higher the capital adequacy ratio owned by the bank, the higher the NIM generated by the bank because a high capital ratio indicates the bank's ability to provide funds for lending purposes so as to obtain higher interest income, as well as accommodate possible risks of losses resulting from bank operations. The higher the ratio, the better the capital position. This shows that the bank has large funds to channel as credit, making the bank earn higher interest income thereby increasing the NIM ratio. LDR describes the amount of credit disbursed by the bank. An increase in LDR indicates an increase in credit that can be distributed by banks, so that this increase has an effect on increasing NIM, due to higher interest income originating from disbursed credit.

Research conducted by (Susilawati & Nurulrahmatiah, 2021) LDR has a significant effect on NIM. This means that an increase in LDR will have an impact on increasing NIM, because there will be an increase in bank interest income obtained from disbursed loans. In credit distribution, this risk is usually called NPL, namely problematic credit. In practice, if the NPL ratio is higher, the higher the credit risk that the bank must face. According to research (Anindiansyah et al., 2020) shows that NPL has a positive influence on NIM.

2.2 The effect of CAR, LDR, NPL and NIM on ROA

(Humairoh & Agustina, 2022) stated the CAR ratio value continues to increase every year during the research period and this is linear with ROA or profitability. This condition is influenced by advances in technology which allows some people to start building businesses and apply for bank loans. This need creates an opportunity to increase profitability so that banks increase their capital. If the capital value is high then profits will also increase. According to (Rafinur et al., 2023) LDR is a ratio used to measure the comparison between the total credit provided by the bank and the bank's ability to repay withdrawals made by saving customers who rely on the credit provided as a source of liquidity. LDR reflects the bank's ability to repay funds withdrawals made by depositors by relying on the credit provided as a source of liquidity, in other words the extent to which theprovision of credit to credit customers can offset the bank's obligation to immediately fulfill the requests of depositors who wish to withdraw their money that has been used by the bank to provide credit provided with total third party funds.

The more third party funds that can be collected from the community, the greater the opportunity to get a return from the use of these funds. NPL are bad credit or problematic credit which causes losses for the bank because the credit provided cannot be returned. NPL is used to measure the quality of credit by comparing non-performing loans with total existing credit. Apart from that, the higher the NPL ratio, the worse the quality of bank credit will be and the bank will have to bear losses in its operational activities, which will affect ROA. NIM is a risk that grows due to market conditions, this can cause banks to experience losses. The large NIM will increase net interest income and channel profits to the bank. NIM is a factor that needs to be considered to determine the profitability of a bank. Based on the NIM which is in line with ROA, if loan interest increases, this will have an impact on profitability which will also increase (Dewanti et al., 2022).

2.3 NIM mediates the influence of the CAR, LDR, NPL variable on ROA

A good CAR will increase the NIM, so that if the NIM is adequate or high, the bank's profitability level will change (Ferly et al., 2023). Meanwhile, Anindiansyah *et al* (2020) stated The influence of Loan to Deposit Ratio (LDR) on Return on Assets (ROA) which is mediated through Net Interest Margin (NIM) is supported by bank theory, namely loan rate mark up, namely the bank sets a higher markup to protect targeted profits or profits. This shows that good bank liquidity will be able to increase ROA, if thebank's interest income (NIM) is large. A bank's Non-Performing Loan (NPL) level that is too high can reduce the bank's possibilityof making a profit. NIM can mediate the effect of NPL on ROA. This means that high NPLs cause a large number of non- performing loans, so that interest income decreases and the resulting profit also decreases.

3. METHOD

This research was conducted on BUMN bank listed on the Indonesia Exchange for the period 2018-2022. This research uses data in the form of secondary data, namely data obtained from the Indonesian Stock Exchange. Secondary data used in this research is data on state-owned bank companies listed on the Indonesia Stock Exchange from 2018 to 2022 which were obtained from the Indonesia Stock Exchange website with the website address www.idx.co.id as well as from the official websites of each company. The dependent variable is Return on Asset (ROA). The independent variable is Capital Adequacy Ratio (CAR), Loan to Deposit (LDR) and Non-Performing Loan (NPL). The intervening variable is Net Interest Margin (NIM). The sampling technique used in this research is nonprobability sampling. The analysis technique in this research uses Smart PLS 3.0 by analysing the inner model such as the coefficient of determination, hypothesis testing and path analysis testing.

4. RESULT AND DISCUSSION

The data used in this research is secondary data in the form of financial information reports of banking sub-sector companieslisted on the Indonesia Stock Exchange (BEI) in 2018-2022.

Table 4. Summary of Research Data

No	Bank	Year	CAR (X1)	LDR (X2)	NPL (X3)	ROA (Y)	NIM (Z)
1.	BBNI	2018	18.50%	88.76%	0.88%	2.45%	5.29%
		2019	19.73%	91.54%	1.26%	2.29%	4.92%
		2020	19.38%	90.52%	0.98%	0.57%	4.50%
		2021	19.74%	79.71%	0.73%	1.30%	4.81%
		2022	19.27%	84.25%	0.49%	2.20%	4.67%
2.	BMRI	2018	20.96%	100.23%	26.40%	2.82%	5.52%
		2019	21.39%	100.68%	20.86%	2.76%	5.46%
		2020	19.71%	90.30%	12.41%	1.63%	4.48%
		2021	19.56%	92.02%	14.29%	2.22%	5.16%
		2022	19.65%	90.51%	14.65%	2.83%	4.73%
3.	BBRI	2018	21.21%	88.22%	0.92%	3.22%	7.45%
		2019	22.55%	88.06%	1.04%	3.06%	6.89%
		2020	20.61%	84.91%	0.80%	1.77%	6.00%
		2021	25.28%	81.08%	0.70%	2.20%	6.89%
		2022	23.30%	82.52%	0.73%	3.46%	6.80%
4.	BBTN	2018	19.21%	113.50%	1.83%	1.34%	4.32%
		2019	17.32%	112.23%	2.96%	0.13%	3.32%
		2020	19.34%	90.70%	2.06%	0.63%	3.06%
		2021	19.14%	90.52%	1.20%	0.80%	4.40%
		2022	20.17%	89.75%	1.32%	0.96%	3.99%

4.1 Inner Model Analysis

The structural model was evaluated using R-Square for the dependent construct. The R Square value can be used to assess the influence of certain endogenous variables and whether exogenous variables have a substantive influence. R Square values of 0.67, 0.33 and 0.19 indicate that the model is strong, moderate and weak. (Ghozali, 2014)

Table 5. Coefficient Determination BUMN Banks

Variabel	R Square	R Square Adjusted
Net Interest Margin (Z)	0.627	0.557
Return on Asset (Y)	0.771	0.709

The first path model is the influence of CAR, LDR and NPL on NIM. It can be seen that the NIM variable has an R-Square value of 0.627. This indicates that the CAR, LDR and NPL have an impact on the NIM of 62.7%, the remaining 37.3% (100% - 62.7 %) is explained by other variables not examined in this study. Therefore, it can be concluded that the strength of the model in the NIM of state-owned bank companies listed on the Indonesia Stock Exchange for the 2018-2022 period can be categorized as moderate or average.

The second path model is the influence of CAR, LDR and NPL through NIM on ROA. The value obtained is 0.771. This means that the ability of the CAR, LDR and NPL variables through NIM in explaining ROA is 77.1% and the remaining is 22.9 % (100% - 77.1%) is explained by other variables not examined in this study. Therefore, it can be concluded that the strength of the model on Return on Assets (ROA) in state-owned banks listed on the Indonesia Stock Exchange for the 2018-2022 period can be categorized as strong.

4.2 Hypotesis Test

Direct Effect (Path Coefficient)

Direct Effect or direct influence analysis is useful for testing the hypothesis of the direct influence of an influencing variable (exogenous) on an influencing variable (endogenous). There are two criteria for direct influence, the first is that if the path coefficient value is positive, then the influence of an exogenous variable on the endogenous variable is in the same direction. So, when the value of the exogenous variable increases, the value of the endogenous variable also increases.

The second criterion is that if the path coefficient value is negative, then the influence of an exogenous variable on the endogenous variable is in the opposite direction. So when the value of the exogenous variable increases, the value of the endogenous variable will decrease.The value for significant Direct Effect measurements is below 0.05. However, the non- significant Direct Effect measurement value is above 0.05.

Table 6. Results on Direct Effect

Causal Relationships	Original Sample (O)	Sample Mean (M)	Standartd Deviation (STDEV)	T-Statistic	P-Values
CAR -> NIM	0,738	0,754	0,110	6,740	0,000
LDR -> NIM	-0,105	-0,099	0,123	0,856	0,393
NPL -> NIM	-0,005	-0,015	0,142	0,034	0,973
CAR -> ROA	-0,175	-0,160	0,258	0,678	0,498
LDR -> ROA	-0,116	-0,097	0,151	0,768	0,443
NPL -> ROA	0,368	0,363	0,15	2,463	0,014
NIM -> ROA	0,903	0,884	0,198	4,558	0,000

1. **H1: Capital Adequacy Ratio (CAR) influences Net Interest Margin (NIM).**

Based on the path coefficient results, the T-Statistics results are 6.740 ≥ 1.96 and the p-value is 0.000 ≤ 0.05 and the Original Sample value is 0.738. This means that there is a significant and unidirectional influence. So, when the CAR variable increases, the NIM variable will increase. These results indicate that the hypothesis results are accepted.

In accordance with the theory put forward by (Maulana et al., 2023) that banks have large funds to be distributed as credit, making banks earn higher interest income thereby increasing the NIM ratio. The higher the level of CAR will be a measure of the success of bank management in obtaining high profits. The positive influence on NIM is the higher the bank's capital adequacy ratio, the higher the NIM generated by the bank. Because a high capital ratio indicates the bank's ability to provide funds for lending purposes so as to obtain higher interest income, as well as accommodate possible risks of losses resulting from bank operations. The higher the ratio, the better the capital position.

2. **H2: Loan to Deposit Ratio (LDR) influences Net Interest Margin (NIM).**

Based on the path coefficient results, the T-Statistics results are 0.856 ≤ 1.96 and the p-value is 0.393 ≥ 0.05 and the Original Sample value is -0.105. This means that there is no significant influence and it is not unidirectional. So, when LDR variable has no influence on the NIM variable.

These results indicate that the hypothesis is rejected. The higher a bank's LDR ratio, it can be said that the bank has a high level of aggressiveness. A bank that has a high LDR means the higher the liquidity risk that must be faced, the bank requires high reserves, so it is possible that the bank will experience liquidity difficulties which will later cause pressure on income. These reserves include liquid assets which will have an impact on reducing NIM. The results of this research are not in line with research conducted by (Susilawati & Nurulrahmatiah, 2021) which stated that it had a significant effect on NIM.

3. H3: Non Performing Loan (NPL) influences Net Interest Margin (NIM).

T-Statistics results are 0.034 ≤ 1.96 and the p-value is 0.973 ≥ 0.05 and the Original Sample value is -0.005. These resultsindicate that the hypothesis is rejected. This means that an increase in NPL cannot reduce the bank's net interest income. This is because the NPL ratio of state-owned banks listed on the IDX for 2018-2022 has a low value, so these results indicate there is no influence on the net interest income earned by these state-owned banks. The results of this research are not in line with research conducted by (Anindiansyah et al, 2020) showing that NPL has a positive influenceon NIM.

4. H4: Capital Adequacy Ratio (CAR) influences Return on Asset (ROA)

T-Statistics results are 0.678 ≤ 1.96 and the p-value is 0.498 ≥ 0.05 and the Original Sample value is -0.175. These resultsindicate that the hypothesis is rejected. The results of this research cannot be used as evidence that the higher the CAR,the higher the ROA the company will get. This means that the bank has not optimized the existing capital to be channeled into credit so that the bank's profits have not been maximized. The results of this research are not in line with research conducted (Humairoh & Agustina, 2022) which states that CAR has an effect on ROA.

5. H5: Loan to Deposit Ratio (LDR) influences Return on Asset (ROA)

Based on the path coefficient results, the T-Statistics results are 0.768 ≤ 1.96 and the p-value is 0.443 ≥ 0.05 and the Original Sample value is -0.116. These results indicate that the hypothesis is rejected. This means that a high LDR ratio will not affect the increase in ROA because it is not accompanied by quality in credit distribution. The greater the risk of lending to third parties, the greater the risk of bad credit. An LDR value that is neither too high nor too low will not havean impact on changes in profits. This research is not in line with research conducted by (Rafinur et al, 2023) and (Admadja et al., 2023) which stated that LDR has an effect on ROA.

6. H6: Non Performing Loan (NPL) influences Return on Asset (ROA)

Based on the path coefficient results, the T-Statistics results are 2.463 ≥ 1.96 and the p-value is 0.014 ≤ 0.05 and the Original Sample value is 0.368. These results indicate that the hypothesis is accepted. NPL is a comparison between substandard, doubtful and bad credit with the total credit given by the bank. A low NPL can increase the ROA value, because a low NPL indicates a lower credit risk borne by the bank. Conversely, if the NPL is higher, the probability of thebank making a profit will be lower. The higher the NPL indicates the worse the quality of bank credit, which causes the number of non-performing loans to increase. The high NPL means that banking companies have to bear losses in their operational activities, which affects ROA.

Anticipatory steps that must be taken to prevent high NPLs in banking are to increase expansion, banks are negligent in the initial credit analysis stage, so that the credit given is too high or the customer should not be given credit but is still given credit. In analyzing credit, this is not only left to the credit analysis section, but credit decision makers must also be careful in analyzing whether prospective debtors are worthy of being granted or not. Apart from that, in terms of extending the credit period, or topping up loan funds. Credit analysis must ensure that the credit that has been given is used according to its intended purpose, considering the current high level of credit misuse. Research in line with (Dewanti et al, 2022) and (Susilawati & Nurulrahmatiah, 2021) states that NPL has an effect on ROA.

7. H7: Net Interest Margin (NIM) influences Return on Asset (ROA)

T-Statistics results are 4.558 ≥ 1.96 and the p-value is 0.000 ≤ 0.05 and the Original Sample value is 0.903. These results indicate that the hypothesis is accepted. If loan interest increases, this will have an impact on profitability which will also increase. The greater the increase in NIM obtained by a bank, the more influence it will have on increasing the bank's profit or ROA. The more efficient banks are in managing productive assets in the form of loans, the more inclusive the NIM value will be. In addition, a higher NIM value can lead to a higher ROA value for the bank, meaning that banking profits will increase (Stephani et al., 2017).

NIM can describe market risks that develop as a result of changes in market variables that cause banking losses. NIM has a positive impact on ROA because NIM is used as a profitability index as a financial ratio to assess the capability of banking management to control assets in obtaining net interest income. This is in line with previous research that NIM has a positive influence on ROA such as research from (Ferly et al, 2023) and (Anindiansyah et al, 2020).

Indirect Effect

Indirect Effect or indirect influence is an analysis that is useful for testing the hypothesis of the indirect influence of an influencing variable (exogenous) on the influenced variable (endogenous) which is mediated by an intervening variable. Just like the Direct Effect, the value for significant Indirect Effect measurements is below 0.5 and those that are not significant are above 0.05.

Table 7. Results on Indirect Effect

Causal Relationships	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistic	P-Value
LDR -> NIM -> ROA	-0,095	-0,090	0,112	0,846	0,398
CAR -> NIM -> ROA	0,667	0,664	0,174	3,829	0,000
NPL -> NIM -> ROA	-0,004	-0,014	0,120	0,037	0,971

1. **H8: Net Interest Margin (NIM) can mediate the influence of the Capital Adequacy Ratio (CAR) variable on Return on Assets (ROA)**

The test results show a P value of 0.000 <0.05, which means it is significant. This means that NIM as an intervening variable plays a role in mediating the relationship between a CAR variable and ROA. The results of this research are in line with research by (Ferly et al, 2023) and (Anindiansyah et al, 2020) which states that NIM significantly mediates the effect of CAR on ROA. A good CAR will increase the Net Interest Margin, so that if the NIM is adequate or high, the bank's profitability level will change.

2. **H9: Net Interest Margin (NIM) can mediate the influence of the Loan to Deposit Ratio (LDR) variable on Return onAssets (ROA)**

The test results show a P value of 0.398 > 0.05, which means it is not significant. This means that Net Interest Margin (NIM) as an intervening variable does not play a role in mediating the relationship between a Loan to Deposit (LDR) variable and Return on Assets (ROA). The results of this research are not in line with research by (Anindiansyah et al, 2020) and (Susilawati & Nurulrahmatiah, 2021) which shows that good bank liquidity can increase ROA without large interest income (NIM).

3. **H10: Net Interest Margin (NIM) can mediate the influence of the Non Performing Loan (NPL) variable on Return on Assets (ROA)**

The test results show a P value of 0.971 > 0.05, which means it is not significant. This means that NIM as an intervening variable does not play a role in mediating the relationship between a NPL variable and ROA. The results of this research are not in line with research conducted by (Anindiansyah et al, 2020) and (Susilawati & Nurulrahmatiah, 2021), that a bank's Non-Performing Loan (NPL) level that is too high can reduce the possibility of the bank make a profit or gain. Theamount of bank interest income is unable to mediate the influence of the bank's ability to rebut non-performing loans on bank profits or ROA. If the level of non-performing loans owned by a bank is too high, then this condition will reduce the possibility of the bank making a profit.

CONCLUSIONS

Based on the inner model test, all variables are in accordance with the provisions. This shows that the available data meets the requirements for using the SEM-PLS model. This research tries to examine the influence of the Capital Adequacy Ratio (CAR),Loan to Deposit (LDR), and Non-Performing Loan (NPL) on Return on Assets (ROA) through Net Interest Margin (NIM) as an intervening variable. Based on the results of the SEM-PLS analysis, it shows that several hypotheses in the research were accepted and several hypotheses were rejected. The following are the conclusions from the analysis results:

1. Capital Adequacy Ratio (CAR) has a significant and positive effect on Net Interest Margin (NIM).
2. Loan to Deposit Ratio (LDR) has no significant and unidirectional effect on Net Interest Margin (NIM).
3. Non Performing Loans (NPL) has no significant and unidirectional effect on Net Interest Margin (NIM).
4. Capital Adequacy Ratio (CAR) has no significant and unidirectional effect on Return on Assets (ROA).
5. Loan to Deposit Ratio (LDR) has no significant and unidirectional effect on Return on Assets (ROA).
6. Non-Performing Loans (NPL) have a significant and unidirectional effect on Return on Assets (ROA).
7. Net Interest Margin (NIM) has a significant and unidirectional effect on Return on Assets (ROA).
8. Net Interest Margin (NIM) can mediate the influence of the variable Capital Adequacy Ratio (CAR) on Return onAssets (ROA).
9. Net Interest Margin (NIM) cannot mediate the influence of the Loan to Deposit Ratio (LDR) variable on Return onAssets (ROA).
10. Net Interest Margin (NIM) cannot mediate the influence of the Non Performing Loan (NPL) variable on Return onAssets (ROA).

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